News Message Neo-Lung
Lund 2018-12-12

Completion of a three-year European project for pulmonary diagnosis of early-born children.

Since 2015, GPX Medical has coordinated a three-year research project funded through the European Eurostars Program - Neo-Lung. Collaborative partners in the project have been Lund University in Sweden, the Norwegian company Norsk Elektro Optikk, and the German laser company Nanoplus. The project is officially closed on 31 December 2018, but on 19-20 November, a final meeting of the project was held in Lund. At the same time, a clinical study is concluded as part of the project at Skåne University Hospital in Lund.

The project's goal has been to develop a medical technology system for diagnosis of lungs in premature infants. Very early born infants - born before pregnancy week 30 - often suffer from complications in the lungs because they are not fully developed. To facilitate breathing, respirators and oxygen in combination with medicines are used. One problem in today's care is to properly diagnose the condition of the lungs so that correct actions can be taken.

In the Neo-Lung project, a system has been developed which is based on the laser spectroscopic analysis technique the parent company of GPX Medical, Gasporox, develops and commercializes. The technology provides the possibility to monitor the oxygen concentration in the lungs using low intense light.

During the course of the project, considerable progress has been made to develop the performance of measurement technology and to develop a medical device suitable for clinical use. The design of the light-source and detector probes is cruicial for the acceptance of the technology and substantial effort has been put into the development of small and lightweight probes to be placed on the chest.

The resulting system is called NEOLA, NEOnatal Lung Analyser, and the system has undergone extensive pre-clinical tests. Among other things, a whole new type of 3D-printed tissue fantomas in polymeric materials has been developed to mimic live lung tissue in infants.

At the end of the project, a clinical study is currently underway at Skåne University Hospital in Lund. The study includes about 15 full-grown healthy babies, 1-2 days old. After approval of the parents, test measurements are made on the children's lungs to evaluate the possibilities of the technique. The preliminary results show that the technique works and can measure the presence of oxygen in the lungs.

Vineta Fellman, Professor of Neonatology and Clinical Project Party, comments:

"This is a big step toward a clinically useful method of monitoring the gas content in the lungs to improve detection of pulmonary complications, while avoiding ionizing radiation”

After the end of the Neo-Lung project, GPX Medical, together with the clinical researchers at Lund University, plans to proceed and carry out further studies. At Norsk Elektro-Optikk and Nanoplus, there is further improved electronics and laser technology that can be used to upgrade the NEOLA system and achieve even better performance.

"There are very promising results made in the project," says Märta Lewander Xu, CEO of GPX Medical. "Thanks to the fine work done by all partners, we have a clinically functioning system. The project has already received several scientific articles published. Now we will improve the system further with the technical components developed in the last months of the project, while planning for further clinical studies. "

The goal of GPX Medical is to launch a medical device for use in the monitoring of lungs in neonatal departments.

Published manuscripts related to the Neo-Lung project:

1. Development of a 3-dimensional tissue lung phantom of a preterm infant for optical measurements of oxygen-Laser-detector position considerations.
Larsson J, Liao P, Lundin P, Krite Svanberg E, Swartling J, Lewander Xu M, Bood J, Andersson-Engels S.
J Biophotonics. 2018 Mar; 11(3)

2. Computer simulation analysis of source-detector position for percutaneously measured O2 -gas signal in a three-dimensional preterm infant lung.
Liao P, Larsson J, Krite Svanberg E, Lundin P, Swartling J, Lewander Xu M, Bood J, Andersson-Engels S.
J Biophotonics. 2018 Nov;11(11)